

### **REMARKS/ARGUMENTS**

Claims 1, 4-6, 8-9 and 22-24 have been amended by this Response. Claim 21 has been cancelled. The limitations of claim 21 have been incorporated into claim 1. Claims 22-24 have been amended to correct claim dependencies. Claim 6 has been amended for readability. Claims 1-20 and 22-30 are currently pending in this application, and are at issue herein.

#### **§ 112 Claim Rejections**

Claims 4 and 8-9 stand rejected under § 112, second paragraph, as indefinite. Specifically, the Examiner has indicated that the term "adiabatic" is indefinite because the specification does not clearly redefine the term. The Examiner has suggested that Applicants amend the specification and claims to change all occurrences of "an adiabatic material" to either "a thermal insulation material" or "a thermally insulating material".

In response, Applicants have amended claims 4 and 8-9, as well as the specification, to change all occurrences of "an adiabatic material" to read "a thermally insulating material". Applicants have also amended claim 5 in this manner, since the term "adiabatic" also appears therein. Applicants submit that the Examiner's rejections have been overcome and respectfully request withdrawal thereof.

#### **§ 103 Claim Rejections**

Claims 1-4, 15-16, 18 and 25-30 stand rejected under § 103(a) as obvious over U.S. Patent No. 2,704,727 to Pawlyk ("Pawlyk") in view of U.K. Patent Application No. 2,223,509 to Antell ("Antell").

Claims 10-12 and 26 stand rejected under § 103(a) as being obvious over Pawlyk in view of Antell, and further in view of U.S. Publication No. 2003/0072875 to Sandhu ("Sandhu").

Claims 13-14 stand rejected under § 103(a) as being obvious over Pawlyk in view of Antell, further in view of Sandhu, and further in view of U.S. Patent No. 4,516,527 to Sugioka ("Sugioka").

Claim 16 stands rejected under § 103(a) as being obvious over Pawlyk in view of Antell, further in view of U.S. Patent No. 5,076,206 to Bailey et al. ("Bailey").

Claim 17-20 stand rejected under § 103(a) as being obvious over Pawlyk in view of Antell, further in view of U.S. Patent No. 5,019,423 to Hiai et al. ("Hiai") and U.S. Patent No. 5,322,710 to Visser ("Visser").

Claims 21-23 stand rejected under § 103(a) as being obvious over Pawlyk in view of Antell, further in view of U.S. Publication No. 2003/0053799 to Lei ("Lei").

Claim 24 stands rejected under § 103(a) as being obvious over Pawlyk in view of Antell and Lei, and further in view of Hiai or Visser.

Claims 1-4, 6-8, 15-16, 18 and 28-30 stand rejected under § 103(a) as obvious over WIPO Publication No. 02/27064 to Jurgensen et al. ("Jurgensen")<sup>1</sup> in view of Japanese Patent No. JP 2001104769 to Tsuboi ("Tsuboi") or Pawlyk, and further in view of Applicants' description of the prior art described at pages 1-4 and Fig. 1 of the specification.

Claims 5 and 9 stand rejected under § 103(a) as obvious over Jurgensen in view of Tsuboi or Pawlyk, further in view of Applicants' description of the prior art, and further in view

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<sup>1</sup> U.S. Publication No. 2003/0192471, which is a patent family equivalent of Jurgensen, was used by the Examiner as an English translation in the statement of rejection set forth in the Office Action.

of U.S. Patent No. 5,451,258 to Hillman et al. ("Hillman") or U.S. Patent No. 6,319,327 to Tsukada et al. ("Tsukada").

Claim 16 stands rejected under § 103(a) as obvious over Jurgensen in view of Tsuboi or Pawlyk, further in view of Applicants' description of the prior art, and further in view of Bailey.

Claims 17-20 stand rejected under § 103(a) as obvious over Jurgensen in view of Tsuboi or Pawlyk, further in view of Applicants' description of the prior art, and further in view of Hiai and U.S. Patent No. 4,861,524 to Sielaff et al. ("Sielaff").

Claims 25-27 stand rejected under § 103(a) as obvious over Jurgensen in view of Tsuboi or Pawlyk, further in view of Applicants' description of the prior art, and further in view of Hiai and Antell.

Currently pending claims 1-20 and 22-30 stand rejected over various combinations of 13 different references plus Applicants' description of the prior art. Applicants respectfully traverse the claim rejections for at least the following reasons.

Independent claim 1, which is the only independent claim in this application, recites a gas supplying apparatus for atomic layer deposition including, *inter alia*, "***a plurality of guide plates formed of a plurality of layers are formed in the container, so as to elongate a gas exhaust path.***" This limitation has been taken from original claim 21, which has been cancelled herein. None of the various references cited in the Office Action teach or suggest this limitation.

The Office Action rejected claim 21, now claim 1, over Pawlyk in view of Antell and further in view of Lei. For at least the reasons set forth below, Applicants' submit that the rejection is improper.

Lei is cited in the Office Action as teaching the guide plates now recited in independent claim 1. However, the guide plates of the present application are installed to elongate the gas

exhaust path to prevent the powder source from being exhausted together with the carrier gas. Conversely, the structures of Lei cited in the Office Action are designed to hold the solid precursor material to increase the surface area of vaporization. The surfaces 6 of Lei are provided to solve the problem of a lack of control of solid precursor vaporization due to the changing surface area of the bulk solid precursor as it is vaporized. (Lei, paragraph [0006]). The surfaces 6 of Lei include a solid precursor applied to the surface by a means that will permit it to remain thereon. The surface 6 may be of any configuration, as it is only designed to increase the surface area of contact between the carrier gas and the solid precursor material. (Lei, paragraph [0026]).

Thus, while the guide plates recited in claim 1 are designed to assist in the removal of powdered source material from the carrier gas, the surfaces 6 of Lei are designed to add more precursor material to the carrier gas. Since Lei is designed for solid precursor vaporization, while the present application is directed to the vaporization of a powdered source, one looking to solve the problem of preventing powder from exiting the vaporization container would not look to Lei for such a solution.

Even assuming, *arguendo*, that one would look to Lei to solve the problem of powder being picked up by the carrier gas, Lei teaches against the use of guide plates to form an elongate gas exhaust path as recited in amended claim 1. Lei notes the problem of powdered solid precursor material being picked up by the carrier gas at paragraph [0029]. Lei notes, in the same paragraph, that using the surfaces 6 to hold the solid precursor material allows better handling of the material, thus reducing the risk of particles of solid material being picked up by the carrier gas. Lei teaches applying the solid precursor material to the surfaces 6 by pressing the material onto the surface, or by dipping the surface into a dissolved precursor. (Lei, paragraph [0030]).

Most importantly, Lei includes no teaching or suggestion that the surfaces disclosed therein are plates, and further includes no teaching or suggestion of orienting the surfaces in the container in such a manner as to form an elongate gas exhaust path. Conversely, the guides plates recited in amended claim 1 are provided to redirect the exhaust gas and provided to elongate the exhaust gas path so that powdered source material is efficiently prevented from being exhausted with the carrier gas. Thus, the guide plates of the claimed invention and the "surfaces" of Lei are provided for distinctly different purposes, and only through impermissible hindsight reconstruction has the Examiner equated the "surfaces" of Lei with the guide plates of the claim invention. As such, Applicants submit that a *prima facie* case of obviousness has not been established.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be a suggestion or motivation, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the reference teachings. Second, there must be a reasonable expectation of success. Third, the references themselves must teach or suggest all of the claim limitations. This teaching or suggestion to modify or combine the references and the reasonable expectation of success must be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); MPEP § 2142.

When the motivation to combine the teachings of the references is not immediately apparent, it is the duty of the examiner to explain why the combination of the teachings is proper. Ex parte Skinner, 2 USPQ2d 1788 (Bd. Pat. App. & Inter. 1989). In the Office Action, it is indicated that "[i]t would have been obvious to use the vaporization container of Lei and the gas source apparatus of Pawlyk because Lei teaches that his guide plate arrangement provides a

controlled and reproducible rate of vaporization." (Office Action dated March 29, 2005, pg. 6, para. 1). This statement does not provide the requisite motivation to combine the references. Further, even if the references were combined, such combination would not meet the claim limitations of providing guide plates in the container to elongate the gas exhaust path. The surfaces of Lei are provided to increase the surface area of solid material in the container so that such material may be vaporized. The controlled and reproducible rate of vaporization in Lei is due to increasing and controlling the surface area of material being vaporized by adding in the container surfaces having solid precursor material thereon. On the other hand, the guide plates of the present invention are installed to elongate the gas exhaust path such that the powder source is more effectively prevented from being exhausted together with the carrier gas. (Application, pg. 11, lns. 26-32). The guide plates are not provided for vaporization purposes but, rather, are provided to remove particles picked up by the carrier gas as the gas exits the container. Thus, the Office Action provides no suggestion or motivation to combine Pawlyk, Antell and Lei. Further, even if the references were combined, such combination still would not meet the claimed limitations.

Further, the mere fact that the references cited in the Office Action can be combined or modified does not render the resultant combination obvious unless the references also suggest the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). As the Federal Circuit has stated, "virtually all [inventions] are combinations of old elements." Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed. Cir. 1983); *see also* Richdel, Inc. v. Sunspool Corp., 714 F.2d 1573, 1579-80, 219 USPQ 8, 12 (Fed. Cir. 1983) ("Most, if not all, inventions are combinations and mostly of old elements.") Therefore, the Patent Office may often find every element of a claimed invention in

the prior art. If mere identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claim elements would permit the Patent Office to use the claimed invention itself as a template for piecing together elements in the prior art to negate the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." Sensonics, Inc. v. Aerosonic Corp., 81 F.3d 1566, 1570, 38 USPQ2d 1551, 1554 (Fed. Cir. 1996).

As the Federal Circuit has repeatedly stated:

The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.

. . .

. . . It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate a claimed invention."

In re Fritch, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992) (*citations omitted*).

Additionally, the teaching or suggestion to make the proposed combination and the reasonable expectation of success must both be found in the prior art, and not in Applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347,

21 USPQ2d 1941 (Fed. Cir. 1992). In the present case, neither the references themselves nor the knowledge generally available to one of ordinary skill in the art teach or suggest combining Pawlyk, Antell and Lei as proposed in the Office Action. Accordingly, the combination proposed in the Office Action is improper.

The rationale provided in the Office Action for combining Pawlyk, Antell and Lei is improper. There is no teaching or suggestion in any of these references, or in the knowledge generally available to one of ordinary skill in the art, to combine these references to arrive at Applicants' claimed invention. To the contrary, the references, specifically Lei, teach directly against any such combination. Only through impermissible and improper hindsight reconstruction has the Examiner been able to piece together isolated disclosures in Pawlyk, Antell and Lei in an attempt to arrive at Applicants' claimed invention. It is well settled that such hindsight reconstruction is improper.

Accordingly, independent claim 1 is believed allowable of the prior art of record.

Dependent claims 2-20 and 22-30 depend cognately from independent claim 1, and add features which further remove the present invention from the prior art. Given at least the distinctions identified above, the dependent claims are believed allowable over the prior art and a separate discussion of the dependent claims will not be belabored for the sake of brevity.

For example, claim 23 recites a plurality of steps formed at predetermined gaps in the container in a height direction, with the plurality of guide plates respectively supported by the plurality of steps. An embodiment of claim 23 is illustrated in the exploded portion of Fig. 5. Neither Pawlyk nor Antell nor Lei include any teaching or suggestion of forming a plurality of steps in the container, with the plurality of guide plates supported by the plurality of steps. Additionally, the other references cited by the Examiner are also devoid of any such teaching.



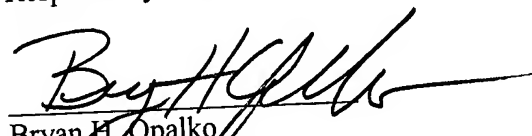
**Conclusion**

Applicants' invention is a novel gas supplying apparatus for atomic layer deposition which includes, among other things, a plurality of guide plates formed in the container so as to elongate a gas exhaust path, such that the powder source is more effectively prevented from being exhausted together with the carrier gas. Accordingly, for at least the above-identified reasons, Applicants submit that claims 1-20 and 22-30 are allowable of the prior art of record. Early notification to that effect is respectfully requested.

It is believed that this Response requires a two-month extension. Accordingly, a petition for a two-month extension of time and a check for \$450.00 to cover the extension fee are submitted herewith. The Commissioner is hereby authorized to charge any underpayment and credit any overpayment to Deposit Account No. 02-4553.

Respectfully submitted,

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